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VERIFICATION OF A TRANSLATION

I, the below named translator, hereby declare that:

My name and post office address are as stated below;

That I am knowledgeable in the German language in which the above identified International Application was filed, and that, to the best of my knowledge and belief, the English translation of the new patent claims of the International Application No. PCT/EP03/10964 is a true and complete translation of the new patent claims of the identified International Application as filed.

I hereby declare that all the statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the patent application issued thereon.

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Patent claims

1. Device for checking the authenticity of a forgery-proof marking with colors which change depending on the angle of observation, with

a) several first light sources (1) which are emitting light in a specified spectral range, wherein the first light sources (1) differ from one another in the wavelength of their emission maximum, and wherein the first light sources (1) are installed in a housing (5) so that they irradiate the surface (O) under a specified first angle ($\alpha 1$) when the housing is placed on this surface,

b) a first means (2) located at a second angle ($\alpha 2$) for the measurement of the intensities of the light reflected by the surface (O), and

c) a means (7) of automatic comparison of the measured intensities with the stored reference intensities for the respective light sources (1) for at least one specified color.

2. Device as defined in claim 1, wherein several second light sources (3) which are emitting in a specified spectral range are provided, wherein the second light sources (3) differ from each other in the wavelength of their emission maximum, and wherein the second light sources (3) are installed in the housing (5) so that they irradiate the surface (O) under a specified third angle ($\beta 1$) when the housing is placed on top of the surface.

3. Device as defined in one of the preceding claims, wherein a second means (4) located at a fourth angle ($\beta 2$) is

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provided for the measurement of the intensities of the light reflected from the surface (O).

4. Device as defined in one of the preceding claims, wherein the specified spectral range has a width of less than 100 nm, preferably of less than 50 nm at half maximum intensity.

5. Device as defined in one of the preceding claims, wherein the light sources (1, 3) are light-emitted diodes, lasers or the free ends of thereby connected light-conducting fibers.

6. Device as defined in one of the preceding claims, wherein the means of measuring the intensities has at least one photo diode (2, 4).

7. Device as defined in one of the preceding claims, wherein the light which is beamed onto the surface (O) at the first angle ($\alpha1$) measured is specularly reflected at the second angle ($\alpha2$).

8. Device as defined in one of the claims 3 to 7, wherein the light which is beamed onto the surface (O) at the third angle ($\beta1$) is measured specularly reflected at the fourth angle ($\beta2$).

9. Device as defined in one of the preceding claims, wherein the first ($\alpha1$) angle and the third angle ($\beta1$) differ from each other and are located in a range from 5° to 60°, preferably from 15° to 45°.

10. Device as defined in one of the preceding claims, wherein a unit for the sequential illumination of the surface (O) with the light sources (1, 3) and for the measurement (2,

4) of the particular intensities of the reflected light in a defined sequence is provided.

11. Device as defined in one of the preceding claims, wherein the emission maximum of the light sources (1, 3) is in the near UV, in the visible or in the IR spectral range.

12. Device as defined in one of the preceding claims, wherein the illumination and measuring duration is specified in dependence on the luminance characteristic of each of the light sources (1, 3) and/or the measuring characteristic of the means (2, 4) of measuring the intensities.

13. Device as defined in one of the preceding claims, wherein a mechanical, electronic or technical software unit is provided to offset the background light.

14. Device as defined in one of the preceding claims, wherein a unit is provided to modulate the light sources (1, 3) for the separation of the interference signals from the measuring signals.

15. Device as defined in one of the preceding claims, wherein at least 3 and not more than 12 first (1) and/or second (3) light sources are provided.

16. Device as defined in one of the preceding claims, wherein the means of automatic comparison or of calculating the coordinates in the color range has a micro-controller (7).

17. Device as defined in one of the preceding claims, wherein an indication device (12), preferably a display, or one or more additional light-emitting diodes are provided to indicate the results determined from the comparison.

18. Device as defined in one of the preceding claims, wherein the forgery-proof marking has an electro-magnetic-wave-reflecting first layer (14) connected with an object to which layer an electro-magnetic-wave-permeable, inert second layer (16) with a specified thickness is applied, and wherein a third layer (17) consisting of metallic clusters is applied to the second layer (16).

19. Device as defined in one of the preceding claims, wherein at least one of the layers (14, 16, 17, 18) has a structure.

20. Device as defined in one of the preceding claims, wherein an electro-magnetic-wave-permeable, inert fourth layer (18) covering the third layer (17) is provided.

21. Device as defined in one of the preceding claims, wherein the metallic clusters are made of silver, gold, platinum, aluminum, copper, tin or indium.

22. Device as defined in one of the preceding claims, wherein the second (16) and/or fourth layer (18) is/are made of one of the following materials: metal oxide, metal nitrite, metal carbide, particularly of silicon oxide, silicon carbide, silicon nitrite, tin oxide, tin nitrite, aluminum oxide, aluminum nitrite or polymers, in particular polycarbonate (PC), polyethylene (PE), polypropylene (PP), polyurethane (PUR), polyimide (PI), polystyrene (PS), or polymethacrylate (PMA).

23. Device as defined in one of the preceding claims, wherein a uniquely identifiable coloring can be recognized at an interval between the first (14) and the third layer (17) of less than 2 μm.

24. Device as defined in one of the preceding claims, wherein the layers (14, 16, 17, 18) is/are made via thin-film technology, in particular via PVD, CVD or printing technologies such as gravure printing.

25. Method for checking the authenticity of a forgery-proof marking with colors which change depending on the angle of observation, consisting of the following steps:

aa) Irradiation of the surface (O) with several first light sources (1) emitting light in a specified spectral range at a first angle ($\alpha 1$), wherein the light sources (1, 3) differ from each other in the wavelength of their emission maximum,

bb) Measurement of the intensities of the light reflected by the surface (O) at a second angle ($\alpha 2$),

cc) Comparison of the measured intensities with reference intensities stored for the particular light sources (1, 3) for at least one specified color.

26. Method as defined in claim 25, wherein the surface is illuminated via several second light sources (3) emitting in a specified spectral range at a third angle ($\beta 1$), wherein the second light sources (3) differ from each other in the wavelength of their emission maximum.

27. Method as defined in one of the claims 25 or 26, wherein the specified spectral range has a width of less than 100 nm, preferably less than 50 nm, at half maximum intensity.

28. Method as defined in one of the claims 25 to 27, wherein the intensities of the light reflected by the surface (O) are measured at a fourth angle ($\beta 2$).

29. Method as defined in one of the claims 25 to 28, wherein the illumination (α1, β2) and measuring angle (α2, β2) are specified by installing the light sources (1, 3) and the means (2, 4) of measuring the intensities in a common housing (5).

30. Method as defined in one of the claims 25 to 29, wherein light-emitting diodes, lasers or the free ends of thereby connected light-conducting fibers are used as light sources (1, 3).

31. Method as defined in one of the claims 25 to 30, wherein at least one photo diode (2, 4) is used as the means of measuring the intensities.

32. Method as defined in one of the claims 25 to 31, wherein the light beamed onto the surface (O) at the first angle (α1) is specularly reflected and measured at the second angle (α2).

33. Method as defined in one of the claims 25 to 32, wherein the light beamed onto the surface (O) at the third angle (β1) is specularly reflected and measured at the fourth angle (β2).

34. Method as defined in one of the claims 25 to 33, wherein the first (α1) and the third (β1) angle differ from one another and are in a range from 5° to 60°, preferably 15° to 45°.

35. Method as defined in one of the claims 25 to 34, wherein the light sources (1, 3) are run sequentially in a defined order.

36. Method as defined in one of the claims 25 to 35, wherein the emission maximum of the light sources (1, 3) is located in the near UV, in the visible or in the IR spectral range.

37. Method as defined in one of the claims 25 to 36, wherein the duration of illumination and measurement is specified in dependence on the luminance characteristic of each of the light sources (1, 3) and/or the measurement characteristic of the means (2,4) of measuring the intensities.

38. Method as defined in one of the claims 25 to 37, wherein background light is compensated via mechanical, electronic or technical software measures.

39. Method as defined in one of the claims 25 to 38, wherein the light sources (1, 3) are modulated to separate the interference signals from the measuring signals.

40. Method as defined in one of the claims 25 to 39, wherein at least 3 and not more than 12 first (1) and/or second light sources (3) are provided.

41. Method as defined in one of the claims 25 to 40, wherein the automatic comparison or the calculation of the coordinates in the color range is performed using a microcontroller (7).

42. Method as defined in one of the claims 25 to 41, wherein the result determined during the comparison is indicated via an indication device (12), preferably a display or one or more additional light-emitting diodes.

43. Method as defined in one of the claims 25 to 42, wherein a marking is used as forgery-proof marking which has a first layer (1) which reflects electro-magnetic waves and is con-

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nected with an object, on which first layer an inert, electro-magnetic-wave-permeable second layer (3) with a specified thickness is applied, wherein a third layer (4) made of metallic clusters is applied to the second layer (3).

44. Method as defined in claim 43, wherein at least one of the layers (1, 3, 4, 5) has a structure.

45. Method as defined in claim 43 or 44, wherein an inert fourth layer (5) is provided which covers the third layer (4) and which can be permeated by electro-magnetic waves.

46. Method as defined in one of the claims 43 to 45, wherein the metallic clusters are made of silver, gold, platinum, aluminum, copper, tin, iron, cobalt, chromium, nickel, palladium, titanium or indium.

47. Method as defined in one of the claims 43 to 46, wherein the second (3) and/or fourth layer (5) is/are made of one of the following materials: metal oxide, metal nitrite, metal carbide, particularly of silicon oxide, silicon nitrite, tin oxide, tin nitrite, aluminum oxide, aluminum nitrite or polymers, in particular polycarbonate (PC), polyethylene (PE), polypropylene (PP), polyurethane (PUR), polyimide (PI), polystyrene (PS), polyethylene terephthalate (PET) or polymethacrylate (PMA).

48. Method as defined in one of the claims 43 to 47, wherein a uniquely identifiable coloring can be recognized at an interval between the first (1) and the third layer (4) of less than 2 μm.

49. Method as defined in one of the claims 43 to 48, wherein the layers (14, 16, 17, 18) is/are made via thin-film tech-

nology such as PVD or CVD as well as printing technologies such as gravure printing.